

Presents the Fall 2012 EECS Seminar Series

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“Ear-Phone: A Participatory Sensing System for Noise Monitoring”

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ABSTRACT

A noise map facilitates monitoring of environmental noise pollution in urban areas. It can raise citizen awareness of noise pollution levels, and aid in the development of mitigation strategies to cope with the adverse effects. However, state-of-the-art techniques for rendering noise maps in urban areas are expensive and rarely updated (months or even years), as they rely on population and traffic models rather than on real data. Participatory urban sensing can be leveraged to create an open and inexpensive platform for rendering up-to-date noise maps. In this talk, we present the design, implementation and performance evaluation of an end-to-end participatory urban noise mapping system called Ear-Phone. Ear-Phone, for the first time, leverages Compressive Sensing to address the fundamental problem of recovering the noise map from incomplete and random samples obtained by crowdsourcing data collection. Ear-Phone, implemented on Nokia N95 and HP iPAQ mobile devices, also addresses the challenge of collecting accurate noise pollution readings at a mobile device. Extensive simulations and outdoor experiments demonstrate that Ear-Phone is a feasible platform to assess noise pollution, incurring reasonable system resource consumption at mobile devices and providing high reconstruction accuracy of the noise map.

BIOGRAPHY

Salil obtained a B.E. in Electrical Engineering from VJTI, Bombay, India in 1998 and received his M.S. and Ph.D., both in Electrical Engineering from Drexel University, Philadelphia, USA in 2001 and 2003 respectively. Since 2004, Salil is with the School of Computer Science and Engineering at the University of New South Wales in Sydney, Australia, where he is currently an Associate Professor.

Salil's current research interests are in the areas of pervasive computing, sensor networks, participatory sensing, mobile networking and network security. He has published over 80 peer-reviewed manuscripts and delivered tutorial seminars on these topics. Salil is associate editor for the Transactions on Emerging Telecommunications Technologies, ICST Transactions on Ubiquitous Environments and the International Journal of Ad Hoc and Ubiquitous Computing.